Claims

1. A code division multiple access downlink receiver for providing wireless communication between a base station and a mobile station in which the receiver is implemented, the receiver comprising:

a cell searcher for receiving at least one signal from the base station and retrieving therefrom a common code relating to a cell;

a code generator for generating a set of common and dedicated codes relating to at least one communication channel using the output of the cell searcher;

a first path searcher for receiving the at least one signal and performing a search for multiple paths by which the at least one signal arrives at the receiver; and

a canceller for canceling data in the at least one communication channel from the at least one signal based on the output of the code generator and first path searcher.

2. The receiver as in claim 1, wherein the canceller removes the data in the at least one communication channel from the at least one signal.

3. The receiver as in claim 2, wherein the canceller reconstructs the data in the at least one communication channel based on the output of the code generator and first path searcher.

4. The receiver as in claim 3 wherein the canceller applies the minimum mean-square-error optimization criterion.

5. The receiver as in claim 4, wherein the canceller uses channel responses obtained by the receiver in relation to the multiple paths by which the at least one signal arrives at the receiver.

6. The receiver as in claim 1, wherein the at least one communication channel is a common channel in the cell.

7. The receiver as in claim 1, further comprising a channel response estimator for estimating channel responses in relation to the multiple paths by which the at least one signal arrives at the receiver.

8. The receiver as in claim 7, wherein the first path searcher performs the search for multiple paths and estimate channel responses therefor based on the at least one communication channel.

9. The receiver as in claim 8, further comprising a second path searcher for receiving the output of the canceller and performing a search for multiple paths therewith.

10. The receiver as in claim 1, further comprising at least one despreader for receiving the outputs of the canceller and code generator for dispreading the output of the canceller.

11. The receiver as in claim 10, further comprising a Rake combiner for receiving the output of the at least one despreader and combing the despread output.

12. The receiver as in claim 1, further comprising an equalizer for receiving the output of the canceller and code generator for equalizing the output of the canceller.

13. The receiver as in claim 12, further comprising a despreader for receiving the output of the equalizer for despreading the output of the equalizer.

14. The receiver as in claim 13, wherein the equalizer generates equalization coefficients based on the minimization of the total power of the despread output in relation to unused dedicated codes and maximization of the power of the despread output in relation to a dedicated code relating to the mobile station.

15. The receiver as in claim 14, wherein the equalizer generates the equalization coefficients based on the minimization of the power of the despread output in relation to a dedicated code relating to the at least one communication channel.

16. The receiver as in claim13, wherein the equalizer generates equalization coefficients based on the minimization of the total power of the despread output in relation to unused dedicated codes and maximization of the total power of the despread output in relation to all orthogonal dedicated codes in the cell.

17. The receiver as in claim 16, wherein the equalizer generates the equalization coefficients based on the minimization of the power of the despread output in relation to a dedicated code relating to the at least one communication channel.

18. A code division multiple access downlink reception method for providing wireless communication between a base station and a mobile station in which a receiver employing the method is implemented, the method comprising the steps of:

receiving using a cell searcher at least one signal from the base station and retrieving therefrom a common code relating to a cell;

generating using a code generator a set of common and dedicated codes relating to at least one communication channel using the output of the cell searcher;

receiving using a first path searcher the at least one signal and performing a search for multiple paths by which the at least one signal arrives at the receiver;

canceling using a canceller data in the at least one communication channel from the at least one signal based on the output of the code generator and first path searcher;

receiving using an equalizer the output of the canceller and code generator for equalizing the output of the canceller; and

receiving using a despreader the output of the equalizer for despreading the output of the equalizer.

19. The method as in claim 18, wherein the step of equalizing using the equalizer comprises the step of generating equalization coefficients based on the minimization of the total power of the despread output in relation to unused dedicated codes and maximization of the power of the despread output in relation to a dedicated code relating to the mobile station, including the minimization of the power of the despread output in relation to a dedicated code relating to the at least one communication channel.

20. The method as in claim 18, wherein the step of equalizing using the equalizer comprises the step of generating equalization coefficients based on the minimization of the total power of the despread output in relation to unused dedicated codes and maximization of the total power of the despread output in relation to all orthogonal dedicated codes in the cell, including the minimization of the power of the despread output in relation to a dedicated code relating to the at least one communication channel.